PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

EX PARTE VANDERMEIJDEN

Application for Patent

Filed: April 26, 2000

Serial No. 09/558,900

FOR:

CONSTRAINED KEYBOARD DISAMBIGUATION
USING VOICE RECOGNITION

SUPPLEMENTAL APPEAL BRIEF & REQUEST FOR REINSTATEMENT OF APPEAL

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop Appeal Brief-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on June 10, 2004.

Signed: _____
Sue Funchess

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I. REAL PARTY IN INTEREST

The real party in interest is Openwave Systems Inc., the assignee of the present application.

II. RELATED APPEALS AND INTERFERENCES

The undersigned is not aware of any related appeals and/or interferences.

III. STATUS OF THE CLAIMS

There are a total of 25 claims pending in this application (Claims 1-4, 8-11, 14-22, 24, 25, and 28-33). Claims 1-27 were submitted with the application as filed. Claims 28-33 were subsequently added to the application. Claims 5-7, 12, 13, 23, and 26-27 were cancelled during prosecution. All pending Claims stand rejected under 35 U.S.C. §103(a).

Additionally, the Appellant respectfully requests entry of the concurrently filed Supplemental Amendment After Final Rejection under 37 CFR § 1.312 in order to correct a typographical error concerning Claim 29. This correction amends Claim 29 so that it no longer depends on Claim 13 (now cancelled) but instead depends from Claim 10 which is still pending in the application.

Claims 1-4, 8-11, 14-22, 24, 25, and 28-33 all stand rejected under 35 U. S. C. § 103(a) as being unpatentable over *Roth* (USPN 5,131,045) in view of *Brotman et al.* (USPN 5,917,890).

All rejections of pending Claims 1-4, 8-11, 14-22, 24, 25, and 28-33 are appealed.

IV. STATUS OF AMENDMENTS

Appellant filed a response on August 19, 2003 in response to the final rejection by the Examiner dated July 9, 2003. In the Advisory Action dated September 25, 2003, the Examiner stated that the Applicants' response to the final rejection had been considered but was not deemed to place the application in condition for allowance. All amendments were entered.

Appellant filed an Appeal Brief on January 26, 2004 and concurrently filed an Amendment After Final Rejection to correct certain minor typographical errors. In response to the Appeal Brief two new references are cited and new grounds for rejection are asserted in a rejection of all claims. No comment was entered into the record concerning the amendments requested in the Amendment After Final Rejection.

Appellant hereby respectfully requests reinstatement of the appeal under 37 C. F. R. 1.1939b)(2)(ii) and again Appellant asks that the Amendment After Final Rejection (Under 37 CFR § 1.312) (filed concurrently with this Supplemental Appeal Brief) amending certain typographical errors in pending Claim 29 be entered and considered in this appeal.

V. CLAIMS ON APPEAL

The claims on appeal are reproduced below in Appendix A, as required by 37 CFR § 1.192(c)(7).

VI. SUMMARY OF INVENTION

The claims on appeal are directed to an invention that relates to methods and devices for inputting data into electronic devices (in particular, mobile phones). The invention concerns an approach for resolving ambiguous keys in constrained computing devices. One example of such an ambiguous key is a telephone keypad wherein a key corresponding to the number "2" can also correspond to the letters "A", "B", and "C" (e.g., Specification at page 1, lines 18-24 (hereinafter abbreviated as Spec. 1:18-24)). As can be appreciated by those having ordinary skill in the art, other types of ambiguous key arrangements are possible.

One particular implementation of the present invention is directed to mobile communication devices (such as mobile and cellular telephones). However, it is noted that other advantageous implementations can include palm-sized computers, Portable Digital Assistants (Pads), Internet appliances, etc. The invention utilizes a combination of an ambiguous key entry

and a corresponding voice input used together to particularly identify the intended character designation for an entered key.

The principles of the invention can be implemented in numerous ways including, a method, system, device, and a computer readable medium. Several embodiments of the invention are discussed below.

For example, Claims 1-4, 8, 28, and 31 are directed to **methods** of "inputting data in a character-by-character manner to a mobile communication device having a constrained keyboard with ambiguous keys" wherein the device includes a "microphone for picking up voice input". Similarly, Claims 22, 24, 25, and 33 are directed to methods of "for inputting data to a mobile communication device having a constrained keyboard with ambiguous keys, the mobile communication device also having a microphone for picking up voice input".

Claims 9-11, 14-16, 29, and 32 are directed toward a **computer program** invention comprising a "computer readable medium having program code for disambiguating a key selection to a constrained input keyboard of a computing device" wherein "the key selection being ambiguous as to which a plurality of characters is to be input".

Claims 17 and 18 are directed toward a key disambiguation **system** 100 for an ambiguous key input device 104 having a plurality of keys, with each key representing a plurality of different characters, wherein the improvement comprises completely disambiguating a user's key input of a single action on a single one of the keys through use of a user's sound input 102 pertaining to an intended character associated with the single one of the keys (also, see Spec. 7:13-16, 15:15-16). Similarly, Claims 19, 20, and 30 are directed to "a key disambiguation **system**".

Claim 21 is directed to "a mobile communication **device** having a constrained keyboard with ambiguous keys in a character-by-character manner".

More specifically, Claims 1-4, 8, 28, and 31 recite a method of inputting data in a character-by-character manner to a mobile communication device having a constrained keyboard with ambiguous keys" wherein the device includes a "microphone for picking up voice input". The method includes:

"(a) receiving voice input 102 from a user using the microphone 202, the voice input pertaining to a single character (e.g., Spec. 6: 6-11, 5: 18-21, etc.);

(b) detecting (e.g., Spec. 5: 18-21), substantially concurrently (e.g., Spec. 15: 8-10) with said receiving (a), that one of the ambiguous keys of the keyboard has been selected by

the user as a selected key, the selected key having a plurality of characters associated therewith (e.g., Spec. 5:11-16);

(c) obtaining reference patterns associated with the selected key, the reference patterns being a set of predetermined reference patterns selected from a plurality of reference patterns based on the selected key (e.g., Spec. 8: 19-21);

(d) comparing the voice input with the obtained reference patterns to produce comparison data (e.g., Spec. 9: 19-25); and

(e) identifying a character that was intended to be input by the user based on the comparison data (e.g., Spec. 9: 22-27), said identifying (e) of the character that was intended to be input by the user includes at least (e1) determining whether one of the obtained reference patterns matches the voice input based on the comparison data (e.g., Spec. 9: 22 - 10: 2), and (e2) selecting the character from the plurality of the characters associated with the selected key in accordance with the determined one of the obtained reference patterns (e.g., Spec. 9: 2-9),

wherein said identifying (e) is synchronized with the detection of the selected key by said detecting (b) (e.g., Spec. 14: 20- 15:4), and

wherein the obtained reference patterns are speech reference patterns (e.g., Spec. 4: 1-9 and p. 17)."

Additionally, Claim 28 is dependent on Claim 1includes the added limitation of "receiving (a) of the voice input is provided by the user without prompting the user to provide a voice input." (e.g., Spec. 15: 8-10).

Also, Claim 31 is dependent on Claim 1, but further includes the added limitations of "a circular buffer" " used in said identifying (e) of the character that was intended to be input by the user by being synchronized with the detection of the selected key by said detecting (b)" (e.g., Spec. 14: 20-15: 4).

The support for Claims 22, 24, 25, and 33 is similar to that given hereinabove for Claims 1-4, 8, 28, and 31.

Claims 9-11, 14-16, 29, and 32 are directed toward a **computer program** invention comprising a "computer readable medium having program code for disambiguating a key selection to a constrained input keyboard of a computing device" wherein "the key selection being ambiguous as to which a plurality of characters is to be input". The support for such Claims is similar to that expressed with respect to Claims 1-4, 8, 28, and 31 above.

Support for Claims 17, 18, 19, 20, and 30 are is similar to that expressed with respect to Claims 1-4, 8, 28, and 31 above. The mobile communication **device** claimed in Claim 21 and the limitations pertaining thereto find support similar to that expressed with respect to Claims 17, 18, 19, 20, and 30 above.

VII. ISSUES

The issues, which Appellant believes to be most pertinent to the present appeal, include:

a) Whether **Claims 1-4, 8-11, 14-22, 24, 25, and 28-33** are unpatentable under 35 U. S. C. § 103(a) as being obvious over Roth (USPN 5,131,045) in view of *Brotman et al.* (USPN 5,917,890).

The Appellants further request reinstatement of the appeal on the grounds that the new references do not raise significant new issues of patentability and that the new references do not establish that the pending claims are obvious in view of the cited art.

VIII. GROUPING OF THE CLAIMS

The rejected claims do not stand or fall together, and will be argued separately. The following claim groups will be argued separately.

I. Claims 1-4, 8
II. Claim 28
III. Claim 31
IV. Claims 22, 24-25
V. Claim 33
VI. Claims 9-11, 14-16
VII. Claim 29
VIII. Claim 32
IX. Claims 17-18
X. Claims 19-20
XI. Claim 30
XII. Claim 21

IX. ARGUMENTS

The invention relates to an approach for resolving ambiguous keys (i.e., overloaded keys) in constrained computing devices. The invention utilizes a combination of ambiguous key entry and a corresponding voice input to particularly identify an entered key. The invention being claimed is distinguished from the combination of *Roth* (USPN 5,131,045) (hereinafter referred to as *Roth*) and *Brotman et al.* (USPN 5,917,890) (hereinafter referred to as *Brotman*) below.

35 U.S.C. §103 Rejection of Claims 1-4, 8-11, 14-22, 24, 25, and 28-33 under *Roth* in view of *Brotman*

Group I (Claims 1-4 and 8) Argument

Claim 1 pertains to a method for inputting data in a character-by-character manner to a mobile communication device. The mobile communication device has a constrained keyboard with ambiguous keys and a microphone for picking up voice input. Among other things, Claim 1 recites:

> (a) receiving voice input from a user using the microphone, the voice input pertaining to a single character;
> (b) detecting, substantially concurrently with said receiving (a), that one of the ambiguous keys of the keyboard has been selected by the user as a selected key;

Claim 1, lines 5-8.

In contrast, *Roth* teaches a technique for capturing a **string** of intended alphabetic or alphanumeric characters (e.g., words) using indications of telephone keys. Accordingly, *Roth* differs from Claim 1 because *Roth* teaches capturing a string of characters, whereas Claim 1 is specifically limited to a method for inputting data in a character-by-character manner. In addition, the Claim 1 voice input from the user consists of but a **single character**. On the other hand, in *Roth,* the user's voice input pertains to the entire string of characters requiring a user to spell out the complete string that has previously been entered. This has already been admitted by the Examiner in his Response to Appeal Brief.

The Examiner has suggested that letter-by-letter data entry is common and that *Roth* teaches this at column 2: lines 55-60 (hereinafter abbreviated as 2:55-60). This is incorrect, the only mention of any letter-by-letter data input in *Roth* is directed to the correction of erroneously entered data (e.g., *Roth* at 2: 55-60) that has already been entered in the form of words. Moreover, this data correction facility of *Roth* is not accomplished substantially concurrently with an input (e.g., a manually keyed input) as is the case in the claimed

invention. Thus, Roth does not teach or suggest the **substantially concurrent** detecting of a **single ambiguous key** and receiving a corresponding voice input pertaining to **a single character**. Thus, *Roth* does not teach or suggest **substantially concurrent** detection of key entry along with voice nor does *Roth* teach or suggest single character entry

Roth makes these points clear by teaching data entry using words and phrases (*Roth* 4:40-47). In *Roth*, the caller enters a **series** of telephone keys corresponding to a desired alphabetic **string** of characters to be captured (See *Roth*, 3:57-65, and see Fig. 2), and then (in response to a prompt) the caller utters each character of the string (See *Roth* 3:15-17). Thereafter, a string of selected alphabetic characters is formed and presented to the caller, who can then signal whether the generated character string is correct or incorrect. On its face this is a significant distinction between *Roth* and the present invention.

The Examiner offers *Brotman* in an attempt to overcome the deficiencies of *Roth* (e.g., **word** entry only, and word entry not concurrent with keyed entry). However, *Brotman,* suffers from many of the same shortcomings as *Roth*. For example, *Brotman* does not teach or suggest the **substantially concurrent** detecting of a **single ambiguous key** and receiving a corresponding voice input pertaining to **a single character**. *Brotman* "prompts" the user to speak (e.g., Fig. 2, 110) then determines whether there is an error (e.g., Fig. 2, 120-150) and then again "prompts" the user to provide input (e.g., Fig. 2, 170) which the system processes to clarify the spoken input (e.g., Fig. 2, 180-190). Thus, it is quite clear that **Brotman** does not teach or suggest the **substantially concurrent** detecting of a **single ambiguous key** and receiving a corresponding voice input pertaining to **a single character**. Rather than teaching concurrent voice and key input, both *Roth* and *Brotman* teach non-contemporaneous voice and key input usually in response to a "prompt". Thus, rather than teaching Claim 1, the cited references teach away from the **substantially concurrent** detecting of a **single ambiguous key** and receiving a corresponding voice input pertaining to **a single character.** Absent this teaching in both of the cited references it cannot be said that Claim 1 is obvious in view of the cited art.

That the Claim 1 operations of **substantially concurrent** detecting of a single **ambiguous key** and **receiving** a corresponding voice input are not taught by the cited references is made especially clear by the prompt requirement of both *Roth* and *Brotman*. Appellants point out that the *Roth* and *Brotman* systems both specifically require a prompt (*Roth* e.g., 3: 15-18 and 3: 44-56 and *Brotman* Fig. 2, 110, 1170) before the user provides any keyed input. This limitation causes these references to teach away from the invention recited in Claim 1. Specifically, Claim 1 clearly recites that the detection of the selection of one of

the ambiguous keys is performed **substantially concurrently** with the receiving of the voice input from the user. Under such conditions there is no way that *Roth* teaches or suggests such limitations in Claim 1. Even worse, *Brotman* requires two "prompts" (e.g., Fig. 2 110, 170) before the keyed input is provided. Thus, under such circumstances it cannot be said that the selection of one of the ambiguous keys is performed **substantially concurrently** with the receiving of the voice input from the user. In fact quite the opposite is true, with the selection of ambiguous keys coming long afterward (e.g., *Brotman*, Fig. 2, 170, *Roth* 2: 38-48). Additionally, the advantages of *Roth* and *Brotman* are directed to the processing of an entire string of characters together. Thus, it is clear that any pattern matching performed by *Roth* or *Brotman* would not be synchronized with selecting the key. In fact, the combination of *Roth* and *Brotman* teaches precisely away from such an implementation and consequently away from the invention recited in Claim 1.

Additionally, Claim 1 include the limitations of:

> (c) obtaining reference patterns associated with the selected key, the reference patterns being a set of predetermined reference patterns selected from a plurality of reference patterns based on the selected key;
>
> (d) comparing the voice input with the obtained reference patterns to produce comparison data; and
>
> (e) identifying a character that was intended to be input by the user based on the comparison data, said identifying (e) of the character that was intended to be input by the user includes at least (e1) determining whether one of the obtained reference patterns matches the voice input based on the comparison data, and (e2) selecting the character from the plurality of the characters associated with the selected key in accordance with the determined one of the obtained reference patterns,
>
> wherein said identifying (e) is synchronized with the detection of the selected key by said detecting (b), and
>
> wherein the obtained reference patterns are speech reference patterns.
>
> Claim 1, lines 10-23.

Roth requires that the user be prompted in order to provide input *(Roth* 3: 15-17). *Brotman* suffers from the same shortcoming. *Brotman*, at Fig. 2, uses a prompt 110 to ask the user to utter characters. Again at 170 the *Brotman* system prompts the user to enter an input to disambiguate the uttered characters. Thus, in these references the characters must be spoken (in response to a prompt) then the system prompts for a keyed input at some later time. Thus, due to the sequential stepwise behavior of the cited references, the "identifying" step cannot be "synchronized with the detection of the selected key".

Therefore, it is submitted that Claim 1 is not obvious in view of *Brotman* and *Roth* or any reasonable combination thereof. Additionally, for at least the foregoing reasons, it is respectfully submitted that dependent Claims 2-4 and 8 are not obvious in view of the cited art. Accordingly, it is respectfully requested that the Board reverse the Examiner and remand the application to the Examiner with instructions to allow Claims 1-4 and 8.

Group II (Claim 28) Argument

Claim 28 pertains to a method for inputting data in a character-by-character manner to a mobile communication device. Claim 28 is dependent upon Claim 1 which is argued as patentable above. For at least the foregoing reasons presented in Group I, it is submitted that Claim 28 is also patentable. The Examiner stated that *Roth* teaches keyed input without a prompt. This is simply not relevant. Claim 28 is directed to "receiving (a) of the **voice input** is provided by the user without prompting the user to provide a voice input". Thus, the Examiner's statement is inapplicable. Moreover, *Roth* specifically requires prompting in order to solicit voice input (e.g., *Roth* at 3:15-17; 4:66-5:1). Therefore, the Examiner failed to address the further patentable distinctions between Claim 28 and the cited art.

Both *Roth* and *Brotman* clearly provide that the user utterance for the string of characters that have been previously input is **not received until after the system prompts** the user for the same. See, for example, *Brotman*, Fig. 2 at step 110 and *Roth* at 3:15-17; 4:66-5:1. Therefore, the cited references fail to teach or suggest the limitation of receiving the voice input without a prompt. Consequently, these references fail to teach all of the limitations of Claim 28 and therefore fails to establish a *prima facie* case of obviousness as to Claim 28. Moreover, the *Brotman* and *Roth* requirements for prompting clearly teach away from receiving the voice input without prompting the user. On page 4 of the July 9, 2003 Office Action, the Examiner suggested that, although not taught by *Brotman* it would have been obvious for those skilled in the art "to discard the prompt, in *Brotman* teaching, for the purpose of speeding up the process." There is, however, nothing in *Brotman* that would hint, motivate or suggest to those of ordinary skill in the art, that the prompting of the user for the utterance of a string of previously input characters could be eliminated.

Thus, it is hereby submitted that Claim 28 is not obvious in view of *Brotman* and *Roth* for these additional reasons. Accordingly, it is respectfully requested that the Board reverse the Examiner and remand the application to the Examiner with instructions to allow Claim 28.

Group III (Claim 31) Argument

Claim 31 pertains to a method for inputting data in a character-by-character manner to a mobile communication device. Claim 31 is dependent upon Claim 1 which is argued as patentable above. For at least the foregoing reasons presented in Group I, it is submitted that Claim 31 is also patentable. However, it is pointed out that the Examiner listed no other reasons for rejecting Claim 31 other that those set forth in support of the rejection of Claim 1. The Examiner failed to address the further patentable distinctions between Claim 31 and the cited art. Claim 31 includes the further limitation of a "mobile communication device" with "**a circular buffer**" "wherein the circular buffer is used in said identifying (e) of the character that was intended to be input by the user by being synchronized with the detection of the selected key by said detecting (b)."

Roth and *Brotman* both fail to teach or suggest a circular buffer or any of the claimed applications of such a circular buffer. Consequently, these references fail to teach all of the claimed limitations for Claim 31. Therefore, the combination of *Roth* and *Brotman* fail to establish a *prima facie* case of obviousness as to Claim 31. Accordingly, it is respectfully submitted that Claim 31 is not obvious in view of *Roth* and *Brotman* and that this grounds for rejection should be withdrawn. Accordingly, it is respectfully requested that the Board reverse the Examiner and remand the application to the Examiner with instructions to allow Claim 31.

Group IV (Claim 22, 24, 25) Argument

Claim 22 pertains to a method for inputting data to a mobile communication device having a constrained keyboard (having ambiguous keys) and a microphone for picking up voice input. Claim 22 recites various limitations that are similar to those recited in Claim 1. Accordingly, it is submitted that Claim 22 is patentably distinct from *Roth* and *Brotman* for at least similar reasons to those noted above with respect to Claim 1. Additionally, by virtue of their dependence on Claim 22, it is respectfully submitted that, that for at least the foregoing reasons, dependent Claims 24 and 25 are not obvious in view of the cited *Roth* and *Brotman* references. Accordingly, it is respectfully requested that the Board reverse the Examiner and remand the application to the Examiner with instructions to allow Claims 22, 24 and 25.

Group V (Claim 33) Argument

Claim 33 pertains to a method for inputting data to a mobile communication device having a constrained keyboard (having ambiguous keys) and a microphone for picking up voice input. Claim 33 is dependent upon Claim 22 which is argued as patentable above. For at least the foregoing reasons presented in Group IV, it is submitted that Claim 33 is also patentable. However, it is pointed out that the Examiner listed no other reasons for rejecting Claim 33 other that those set forth in support of the rejection of Claim 22. The Examiner failed to address the further patentable distinctions between Claim 33 and the cited art.

Claim 33 includes the further limitation of a "mobile communication device" with "a **circular buffer**" "wherein the circular buffer is used in said identifying (d) of the single character that was intended to be input by the user by being synchronized with the detection of the selected key by said detecting (b)"

As explained herein above with respect to Group III (Claim 31), *Roth* and *Brotman* fail to teach or suggest a circular buffer or any of the claimed applications of such a circular buffer. Consequently, *Roth* and *Brotman* fail to teach all of the claimed limitations for Claim 33. Therefore, *Roth* and *Brotman* fail to establish a *prima facie* case of obviousness as to Claim 33. Accordingly, it is respectfully submitted that Claim 33 is not obvious in view of *Roth* and *Brotman* and that this grounds for rejection should be withdrawn. Accordingly, it is respectfully requested that the Board reverse the Examiner and remand the application to the Examiner with instructions to allow Claim 33.

Group VI (Claims 9-11 and 14-16) Argument

Claim 9 pertains to a computer readable medium having program code for disambiguating a key selection to a constrained input keyboard of a computing device. Among other things, Claim 9 recites:

> program code for detecting whether an ambiguous key of the keyboard has been selected as a selected key;
>
> program code for receiving a voice input corresponding to a single one of the characters associated with the selected key, the voice input being received substantially concurrently with the detection of the selected key;
>
> program code for determining the one of the characters that has been input based on the selected key and the voice input, said program code for determining includes at least
>
> program code for obtaining reference patterns associated with the selected key;

program code for comparing the voice input with the obtained reference patterns to produce comparison data; and

program code for identifying the one of the characters that has been input based on the comparison data, and

wherein said program code for obtaining, said program code for comparing and said program code for identifying are initiated with the detection of the selected key by said program code for detecting.

Claim 9, lines 7-21.

For similar reasons as noted above with respect to Claims 1 and 22 (Groups I and IV), it is submitted that Claim 9 is also not obvious in view of *Roth* and *Brotman*. For example, *Roth* and *Brotman* fail to teach or suggest receiving a voice input substantially concurrently with the detection of a selected key. Therefore, it is submitted that Claim 9 is patentably distinct from *Roth* and *Brotman*. Additionally, for at least the foregoing reasons, it is respectfully submitted that dependent Claims 10, 11, and 14-16 are not obvious in view of *Roth* and *Brotman*. Accordingly, it is respectfully requested that the Board reverse the Examiner and remand the application to the Examiner with instructions to allow Claims 9-11 and 14-16.

Group VII (Claim 29) Argument

Claim 29 pertains to a computer readable medium having program code for receiving voice input provided by a user without prompting. For similar reasons as noted above with respect to Claim 28 present in Group II, it is submitted that Claim 29 is also not obvious in view of *Roth* and *Brotman*. By a concurrently filed amendment (under 37 CFR § 1.312), Claim 29 has been amended to change its dependency from Claim 13 (now cancelled) to Claim 10. As such, Claim 29 now depends from independent Claim 9 which is argued as patentable above. For at least the foregoing reasons presented in Group VI, it is submitted that Claim 29 is also patentable. Moreover, it is also submitted that Claim 29 is patentable for at least the reasons set forth above with respect to Claim 28 (Group II). Accordingly, it is hereby submitted that Claim 29 is not obvious in view of *Roth* and *Brotman* for these reasons and therefore it is respectfully requested that the Board reverse the Examiner and remand the application to the Examiner with instructions to allow Claim 29.

Group VIII (Claim 32) Argument

Claim 32 pertains to a computer readable medium as recited in Claim 9, wherein the mobile computing device has a circular buffer that is used by said program code for identifying the character that was intended to be input by the user by being synchronized with

the detection of the selected key. Claim 32 is dependent upon Claim 9 which is argued as patentable above. For at least the foregoing reasons presented in Group VI, it is submitted that Claim 32 is also patentable. However, it is pointed out that the Examiner listed no other reasons for rejecting Claim 32 other that those set forth in support of the rejection of Claim 9. The Examiner failed to address the further patentable distinctions between Claim 32 and the cited art.

Claim 32 includes the further limitation of "a circular buffer" "wherein the circular buffer is used by said program code for identifying the character that was intended to be input by the user by being synchronized with the detection of the selected key"

As explained herein above with respect to Claim 31 (Group III), *Roth* and *Brotman* fail to teach or suggest a circular buffer or any of the claimed applications of such a circular buffer. Consequently, *Roth* and *Brotman* fail to teach all of the claimed limitations for Claim 32. Therefore, *Roth* and *Brotman* fail to establish a *prima facie* case of obviousness as to Claim 32. Accordingly, it is respectfully submitted that Claim 32 is not obvious in view of *Roth* and *Brotman* and that this grounds for rejection should be withdrawn. Accordingly, it is respectfully requested that the Board reverse the Examiner and remand the application to the Examiner with instructions to allow Claim 32.

Group IX (Claims 17 and 18) Argument

Claim 17 pertains to a "key disambiguate system for an ambiguous key input device having a plurality of keys, with each key representing a plurality of different characters, wherein the improvement comprises completely disambiguating a user's key input of a single action on a single one of the keys through use of a user's sound input pertaining to an intended character associated with the single one of the keys". Claim 17, lines 3-5. Here, the key disambiguate system is directed to processing single keys together with a user's sound input pertaining to the single one of the keys. Hence, for similar reasons to those noted above (e.g., with respect to Group I), it is submitted that *Roth* and *Brotman* fail to teach or suggest the features of Claim 17. Therefore, it is submitted that Claim 17 is not obvious in view of *Roth* and *Brotman*. Additionally, for at least the foregoing reasons, it is respectfully submitted that dependent Claim 18 is not obvious in view of *Roth* and *Brotman*. Accordingly, it is respectfully requested that the Board reverse the Examiner and remand the application to the Examiner with instructions to allow Claims 17 and 18.

Group X (Claims 19 and 20) Argument

Claim 19 pertains to a key disambiguation system that, among other things, recites a key determination unit that "operates in response to the key selection event to determine the one of the characters being input based on the comparison data." Hence, the key determination unit determines the one of the characters being input. The key selection event is triggered by the user's selection of one of the keys of an ambiguous key input device, and the comparison data is produced by comparing a processed voice input with selected ones of reference source patterns in a pattern comparison unit. Hence, the key determination unit operates to identify the character being input on a character-by-character basis. Accordingly, for similar reasons to those presented above in Group I, it is submitted that Claim 19 is not obvious in view *Roth* and *Brotman*.

In addition, it is submitted that the Examiner's rejection of Claim 19 fails to teach or suggest each of the limitations of Claim 19. Consequently, the Examiner in applying *Roth* and *Brotman*, has failed to establish a *prima facie* case of obviousness as to Claim 19. The Examiner's reasons for rejection are inadequate to establish a *prima facie* rejection of Claim 19 under 35 USC §103(a) for failure to consider each of the limitations recited in Claim 19. Among other things, Claim 19 recites, "a data reduction unit coupled to said analog-to-digital circuit, said data reduction unit identifies distinguishing characteristics within the digital voice input as processed voice input" (Claim 19, lines 5-7). The Examiner has not shown that *Roth* and *Brotman* teach or suggest a data reduction unit as recited in Claim 19. Additionally, Claim 19 recites "a keyboard controller coupled to said ambiguous key input device, said keyboard controller detects a user's selection of one of the keys of said ambiguous key input device and invokes a key selection event." (Claim 19, lines 10-12). The Examiner has not shown that *Roth* and *Brotman* teach or suggest a keyboard controller as recited in Claim 19. Still further, Claim 19 recites "a key determination unit coupled to said pattern comparison unit, said key determination unit operates in response to the key selection event to determine the one of the characters being input based on the comparison data." (Claim 19, lines 18-20). Here, it should be noted that the key determination unit operates in response to the key selection event produced by the keyboard controller. Nothing in *Roth* and *Brotman* teach or suggest a key determination unit that is operable in response to a key selection event as recited in Claim 19. Absent these limitations, *Roth* and *Brotman* fail to establish a *prima facie* case of obviousness and thus it is respectfully submitted that this grounds for rejection is inadequate and should be withdrawn.

Therefore, it is submitted that Claim 19 is not obvious in view of *Roth* and *Brotman*. Additionally, for at least the foregoing reasons, it is respectfully submitted that dependent Claim 20 is not obvious in view of *Roth* and *Brotman*. Accordingly, it is respectfully requested that the Board reverse the Examiner and remand the application to the Examiner with instructions to allow Claims 19 and 20.

Group XI (Claim 30) Argument

Claim 30, which depends from Claim 19, further recites that the key determination unit includes a circular buffer. Nothing in *Roth* or *Brotman* teaches or suggests a circular buffer being included within a key determination unit as recited in Claim 30. Consequently, *Roth* and *Brotman* fail to teach all of the claimed limitations for Claim 30 and therefore fail to establish a *prima facie* case of obviousness as to Claim 30. Moreover, Claim 30 is dependent upon Claim 19 which is argued as patentable above. For at least the foregoing reasons, it is respectfully submitted that the Board reverse the Examiner and remand the application to the Examiner with instructions to allow Claim 30.

Group XII (Claim 21) Argument

Claim 21 pertains to a mobile communication device having a constrained keyboard with ambiguous keys in a character-by-character manner. Significantly, Claim 21 recites limitations similar to those recited in Claim 1, although in a different format. For example, Claim 21 includes the limitations of:

> "a microphone configured to receive voice input from a user, the voice input pertaining to a single character;
> means for detecting, substantially concurrently with the receipt of the voice input via said microphone, that one of the ambiguous keys of the keyboard has been selected by the user as a selected key;
> means for obtaining reference patterns associated with the selected key;
> means for comparing the voice input with the obtained reference patterns to produce comparison data; and
> means for identifying a single character that was intended to be input by the user based on the comparison data"
> Claim 21.

As discussed hereinabove with respect to Claim 1 (Group I), *Roth* and *Brotman* do not teach or suggest "voice input pertaining to a single character" and detecting the selection of keys "substantially concurrently with the receipt of the voice input". Accordingly, it is

submitted that Claim 21 is patentably distinct from *Roth* and *Brotman* for at least similar reasons to those noted above with respect to Claim 1.

In addition, it should be noted that several of the claim elements recited in Claim 1 are means plus function elements in accordance with 35 USC §112, paragraph 6. As such, a proper rejection must consider the corresponding structure for these means provided within the patent application. Applicant believes that the failure of the Examiner to perform this analysis causes the rejection to fail to rise to the level of a *prima facie* rejection.

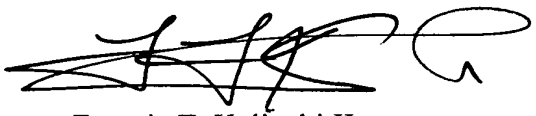
Accordingly, it is respectfully requested that the Board reverse the Examiner and remand the application to the Examiner with instructions to allow Claim 21.

Conclusion

Regarding all the rejections, the cited references fail to teach or suggest elements required in the pending claims. In view of the foregoing, it is respectfully submitted that none of the pending claims are rendered unpatentable by the patents to *Roth* and *Brotman*. Accordingly, the pending rejections of all of the claims under 35 U.S.C. § 103 should be reversed.

Respectfully submitted,

BEYER WEAVER & THOMAS, LLP



Francis T. Kalinski II
Registration No. 44,177

BEYER WEAVER & THOMAS, LLP
P.O. Box 778
Berkeley, CA 94704-0778
Telephone (650) 961-8300

X. APPENDIX A

LISTING OF CLAIMS:

Claim 1 (previously presented): A method for inputting data in a character-by-character manner to a mobile communication device having a constrained keyboard with ambiguous keys, the mobile communication device also having a microphone for picking up voice input, said method comprising:

(a) receiving voice input from a user using the microphone, the voice input pertaining to a single character;

(b) detecting, substantially concurrently with said receiving (a), that one of the ambiguous keys of the keyboard has been selected by the user as a selected key, the selected key having a plurality of characters associated therewith;

(c) obtaining reference patterns associated with the selected key, the reference patterns being a set of predetermined reference patterns selected from a plurality of reference patterns based on the selected key;

(d) comparing the voice input with the obtained reference patterns to produce comparison data; and

(e) identifying a character that was intended to be input by the user based on the comparison data, said identifying (e) of the character that was intended to be input by the user includes at least (e1) determining whether one of the obtained reference patterns matches the voice input based on the comparison data, and (e2) selecting the character from the plurality of the characters associated with the selected key in accordance with the determined one of the obtained reference patterns,

wherein said identifying (e) is synchronized with the detection of the selected key by said detecting (b), and

wherein the obtained reference patterns are speech reference patterns.

Claim 2 (previously presented): A method as recited in claim 1, wherein said obtaining (c), said comparing (d) and said identifying (e) are initiated with the detection of the selected key by said detecting (b).

Claim 3 (original): A method as recited in claim 1, wherein the selected key has a plurality of characters associated therewith, and wherein the character identified is one of the plurality of the characters associated with the selected key.

Claim 4 (original): A method as recited in claim 3, wherein each one of the obtained reference patterns pertains to one of the plurality of characters associated with the selected key.

Claims 5-7 (cancelled).

Claim 8 (original): A method as recited in claim 1, wherein the characters comprise letters or numeric characters.

Claim 9 (previously presented): A computer readable medium having program code for disambiguating a key selection to a constrained input keyboard of a computing device, the key selection being ambiguous as to which a plurality of characters is to be input, said computer readable medium comprising:

program code for detecting whether an ambiguous key of the keyboard has been selected as a selected key;

program code for receiving a voice input corresponding to a single one of the characters associated with the selected key, the voice input being received substantially concurrently with the detection of the selected key; and

program code for determining the one of the characters that has been input based on the selected key and the voice input, said program code for determining includes at least

program code for obtaining reference patterns associated with the selected key;

program code for comparing the voice input with the obtained reference patterns to produce comparison data; and

program code for identifying the one of the characters that has been input based on the comparison data, and

wherein said program code for obtaining, said program code for comparing and said program code for identifying are initiated with the detection of the selected key by said program code for detecting.

Claim 10 (original): A computer readable medium as recited in claim 9, wherein the computing device is a mobile computing device having the constrained input keyboard integral thereto.

Claim 11 (previously presented): A computer readable medium as recited in claim 10, wherein the computing device is a mobile telephone.

Claims 12 & 13 (cancelled).

Claim 14 (previously presented): A computer readable medium as recited in claim 9, wherein the selected key has a plurality of characters associated therewith, and wherein the character identified is one of the plurality of the characters associated with the selected key.

Claim 15 (original): A computer readable medium as recited in claim 14, wherein the computing device is a mobile computing device having the constrained input keyboard integral thereto.

Claim 16 (previously presented): A computer readable medium as recited in claim 15, wherein the computing device is a mobile telephone.

Claim 17 (original): A key disambiguate system for an ambiguous key input device having a plurality of keys, with each key representing a plurality of different characters, wherein the improvement comprises completely disambiguating a user's key input of a single action on a single one of the keys through use of a user's sound input pertaining to an intended character associated with the single one of the keys.

Claim 18 (previously presented): A key disambiguate system as recited in claim 17,

wherein the user's sound input is received substantially simultaneously with the user's key input, and

wherein said key disambiguate system is internal to a mobile telephone having the ambiguous key input device.

Claim 19 (previously presented): A key disambiguation system, comprising:

a microphone for picking up an analog voice input;

an analog-to-digital converter coupled to said microphone, said analog-to-digital microphone converts the analog voice input to a digital voice input;

a data reduction unit coupled to said analog-to-digital circuit, said data reduction unit identifies distinguishing characteristics within the digital voice input as processed voice input;

an ambiguous key input device having a plurality of keys, each of the keys representing a plurality of different characters;

a keyboard controller coupled to said ambiguous key input device, said keyboard controller detects a user's selection of one of the keys of said ambiguous key input device and invokes a key selection event;

a reference sound patterns source coupled to said keyboard controller, said reference sound patterns source stores a plurality of reference sounds;

a pattern comparison unit coupled to said data reduction unit and said reference sound patterns source, said pattern comparison unit operates to compare the processed voice input with selected ones of the reference sound patterns to produce comparison data; and

a key determination unit coupled to said pattern comparison unit, said key determination unit operates in response to the key selection event to determine the one of the characters being input based on the comparison data.

Claim 20 (previously presented): A key disambiguation system as recited in claim 19, wherein said key determination unit identifies a matching one of the selected reference sound patterns, and determines the one of the characters being input from the matching of the selected reference sound patterns.

Claim 21 (previously presented): A mobile communication device having a constrained keyboard with ambiguous keys in a character-by-character manner, said method comprising:

a microphone configured to receive voice input from a user, the voice input pertaining to a single character;

means for detecting, substantially concurrently with the receipt of the voice input via said microphone, that one of the ambiguous keys of the keyboard has been selected by the user as a selected key;

means for obtaining reference patterns associated with the selected key;

means for comparing the voice input with the obtained reference patterns to produce comparison data; and

means for identifying a single character that was intended to be input by the user based on the comparison data.

Claim 22 (previously presented): A method for inputting data to a mobile communication device having a constrained keyboard with ambiguous keys, the mobile communication device also having a microphone for picking up voice input, said method comprising:

(a) receiving user inputs, the user inputs including a voice input from a user using the microphone and a key selection of at least a single one of the ambiguous keys of the keyboard, the key selection has a plurality of characters associated therewith, the voice input pertaining to a single character corresponding to the key selection, and the voice input and the key selection being received substantially simultaneously;

(b) obtaining reference patterns associated with the key selection, the reference patterns being a set of predetermined set of reference patterns selected from a plurality of reference patterns based on the key selection;

(c) comparing the voice input with the obtained reference patterns to produce comparison data; and

(d) identifying a single character that was intended to be input by the user based on the comparison data, said identifying (d) of the character that was intended to be input by the user includes at least (d1) determining whether one of the obtained reference patterns matches the voice input based on the comparison data; and (d2) selecting the character from the plurality of the characters associated with the key selection in accordance with the determined one of the obtained reference patterns,

wherein said identifying (d) is synchronized with the detection of the key selection, and

wherein the obtained reference patters are speech reference patterns.

Claim 23 (cancelled).

Claim 24 (original): A method as recited in claim 22, wherein the key selection has a plurality of characters associated therewith, and wherein the character identified is one of the plurality of the characters associated with the key selection.

Claim 25 (original): A method as recited in claim 24, wherein each one of the obtained reference patterns pertains to one of the plurality of characters associated with the key selection.

Claims 26 & 27 (cancelled).

Claim 28 (previously presented): A method as recited in claim 1, wherein said receiving (a) of the voice input is provided by the user without prompting the user to provide a voice input.

Claim 29 (Currently Amended): A computer readable medium as recited in claim **10 [[~~13~~]]**, wherein said program code for receiving of the voice input is provided by a user without prompting the user to provide a voice input.

Claim 30 (previously presented): A key disambiguation system as recited in claim 19, wherein said key determination unit includes at least a circular buffer.

Claim 31 (previously presented): A method as recited in claim 1, wherein the mobile communication device further has a circular buffer, and

wherein the circular buffer is used in said identifying (e) of the character that was intended to be input by the user by being synchronized with the detection of the selected key by said detecting (b).

Claim 32 (previously presented): A computer readable medium as recited in claim 9, wherein the mobile computing device has a circular buffer, and

wherein the circular buffer is used in by said program code for identifying the character that was intended to be input by the user by being synchronized with the detection of the selected key.

Claim 33 (previously presented): A method as recited in claim 22, wherein the mobile communication device further has a circular buffer, and

wherein the circular buffer is used in said identifying (d) of the single character that was intended to be input by the user by being synchronized with the detection of the selected key by said detecting (b).